Section 8: Trade and Industrial Education 2008-2009

- Course Descriptions
- Course Sequences
- Career Clusters

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Section 8: Trade and Industrial Education
Course Descriptions, Sequences, Career Clusters

Section Overview

This section presents course information applicable to the Trade and Industrial Education program area: course descriptions, course concentration sequences, and career clusters. Following the course description, the remainder of the information for each course is presented in a table. The definitions and criteria below are summarized to clarify and enhance the table components.

Sequences

- A *concentration* is a coherent sequence of courses completed by a student in a specific career area as identified in this planning guide. (A sequence may be comprised of two 36-week courses, one 36-week course and two 18-week courses, or four 18-week courses.)
- A career and technical education *completer* is a student who has met the requirements for a career and technical concentration and all requirements for high school graduation or an approved alternative education program. Students may take additional career and technical education courses that will enhance their career pathway goals.
- A *specialization* is a choice by a student to specialize in an occupational field by taking additional courses in a specific career area as appropriate to his/her career pathway.

Certifications/Licenses/Assessments Available

Completion of certain courses enables students to apply for industry certification, a state license, and/or a national certification. These credentials are beneficial (and sometimes essential) to students seeking employment in a career field or occupational specialty. In addition, students who obtain these credentials earn verified credits toward graduation.

- A *standard credit* is based on a minimum of 140 clock hours of instruction and successful completion of the requirements of the course.
- A *verified credit* is based on a standard credit plus a passing score on the end-of-course SOL test (or other test as described in the Standards of Accreditation 8 VAC 20-131-110). A standard credit may not be verified more than once.
- A *student-selected verified credit* is a credit for a course that includes a test (other than SOL) approved by the Virginia Board of Education.

For students to be eligible to receive student-selected verified credits, their teacher must be certified by the issuing organization relative to the industry certification or licensure. In the case of a CTE program area where there are potential multiple certifications, the teacher must be certified in at least one industry certification that is related to the course and/or course sequence. ***Exception:*** There is no teacher certification requirement for students to receive verified credits upon passing a selected NOCTI assessment related to their CTE program.

Verified credits entitle students to the Career and Technical Education diploma seal. Some verified credits earn students the Advanced Mathematics and Technology seal. Each year, the Virginia Board of Education approves the industry certifications that enable students to earn these seals.

The relationships among Board-approved examinations, verified credits, and diploma seals are explained in the Introduction and in Section 9. Additional information, including the description of each credential, how to earn it, and courses that may prepare students for examination, is contained in Section 10: Course Index and Descriptions of Certifications, Licenses, and Assessments.

Career Clusters

To help students investigate careers and design their courses of study to advance their career goals, the Office of Career and Technical Education Services in Virginia has adopted the nationally accepted structure of 16 career clusters, their accompanying career pathways, and their sample career specialties or occupations.To simplify federal reporting, the *Career and Technical Education Reporting System (CTERS) User's Manual* assigns a career cluster to each course. The cluster is also listed with each course that follows. Because some career clusters overlap (have similar occupations), teachers may have a choice of more than one cluster and should select the most appropriate one based on the student's career pathway for their federal report.

Additional information and samples of how to use career clusters to select CTE courses are included in Section 11: Instructional Planning with Career Clusters, Career Pathways, and Occupations.

CTE Cooperative Education
A number of Trade and Industrial Education courses (as noted in the individual course descriptions) are eligible for the cooperative method of instruction. Students combine classroom instruction and supervised on-the-job training in an approved position with continuing supervision throughout the school year.
Additional information may be found at:
http://www.doe.virginia.gov/VDOE/Instruction/CTE/co-op

- *Career and Technical Education Cooperative Education Handbook* and other required cooperative education documents

http://www.cteresource.org/verso2/search (select "Across the Board" to access other work experience methods of instruction)

- *Learning through Internship*
- *Learning through Job Shadowing*
- *Learning through Mentorship*
- *Learning through Service*

Note: In Trade and Industrial Education, task lists commonly have been shared between related course codes and course titles. To meet new Perkins IV requirements, these competency lists have been divided to specifically address each level (I, II, III, or IV). Please note level III courses in transition.

Course Offerings

Advertising Design I 8570
Suggested Grade Level(s): 10 or 11 (36 weeks)

Students explore the skills and principles involved in the development and function of advertising and the production process. In their course of study, students apply aesthetic theories and technical skills to graphic design objectives. Elements covered include principles of design and illustration, typography, photography, computer graphics, and pre-press theory.

Concentration Sequences (a combination of the course above and those below, equivalent to two 36-week courses) **Students wishing to complete a specialization may take additional courses appropriate to their career pathways.**	**Career Cluster(s) for federal reporting (choose one)**	**Available Credentials upon Completion of the Above Course**
• Advertising Design II 8571	Arts, Audio/Video Technology and Communications	See Section 10 for a listing of applicable credentials (by course name or credential name).

Advertising Design II 8571
Suggested Grade Level(s): 11 or 12 (36 weeks)
Prerequisite(s): Advertising Design I 8570

Students build on the theoretical principles and practical skills gained in Advertising Design I and explore advanced applications. Elements covered are design and illustration techniques, typography, photography, Web graphics and computer animation, advertising techniques, and preparation of print-ready materials. In addition, students assemble a portfolio and explore careers in advertising design. The cooperative education method is available for this course. Students combine classroom instruction and supervised on-the-job training in an approved position with continuing supervision throughout the school year.

Concentration Sequences (a combination of the course above and those below, equivalent to two 36-week courses) **Students wishing to complete a specialization may take additional courses appropriate to their career pathways.**	**Career Cluster(s) for federal reporting (choose one)**	**Available Credentials upon Completion of the Above Course**
• Advertising Design I 8750	Arts, Audio/Video Technology and Communications	See Section 10 for a listing of applicable credentials (by course name or credential name).

Advertising Design III 8572 (This course is in transition.)

Aircraft Pilot Training I 8731

Suggested Grade Level(s): 10 or 11 (36 weeks, minimum 140 hours)

Students participate in flight training, ground school, and simulator instruction to support the flight syllabus while studying meteorology, aerodynamics, navigation, physiology, airfield and flight environments, aircraft maneuvers, and aircraft weight and balance.

Concentration Sequences (a combination of the course above and those below, equivalent to two 36-week courses) **Students wishing to complete a specialization may take additional courses appropriate to their career pathways.**	**Career Cluster(s) for federal reporting (choose one)**	**Available Credentials upon Completion of the Above Course**
• Aircraft Pilot Training II 8732	Transportation, Distribution and Logistics	See Section 10 for a listing of applicable credentials (by course name or credential name).

Aircraft Pilot Training II 8732

Suggested Grade Level(s): 11 or 12 (36 weeks, 280 hours)

Prerequisite(s): Aircraft Pilot Training I 8731

Students continue to participate in flight training, ground school, and simulator instruction to support the flight syllabus while studying meteorology, aerodynamics, navigation, physiology, airfield and flight environments, aircraft maneuvers, and aircraft weight and balance. The cooperative education method is available for this course. Students combine classroom instruction and supervised on-the-job training in an approved position with continuing supervision throughout the school year.

Concentration Sequences (a combination of the course above and those below, equivalent to two 36-week courses) **Students wishing to complete a specialization may take additional courses appropriate to their career pathways.**	**Career Cluster(s) for federal reporting (choose one)**	**Available Credentials upon Completion of the Above Course**
• Aircraft Pilot Training I 8731	Transportation, Distribution and Logistics	See Section 10 for a listing of applicable credentials (by course name or credential name).

Aircraft Pilot Training III 8733 (This course is in transition.)

Automotive Body Repair I–Non-Certified 8679

Suggested Grade Level(s): 10 or 11 (36 weeks, minimum 140 hours)

In the global automotive repair industry, there is a growing demand for qualified auto body technicians. In this course, students are taught non-structural analysis, damage repair, and welding. Students work with a variety of materials, using metal finishing and body filling techniques to prepare surfaces and repair panels. In addition, students practice shop safety and gain career skills.

Concentration Sequences (a combination of the course above and those below, equivalent to two 36-week courses) **Students wishing to complete a specialization may take additional courses appropriate to their career pathways.**	**Career Cluster(s) for federal reporting (choose one)**	**Available Credentials upon Completion of the Above Course**
• Automotive Body Repair II–Non-Certified 8680	Transportation, Distribution and Logistics	See Section 10 for a listing of applicable credentials (by course name or credential name).

Automotive Body Repair II–Non-Certified 8680

Suggested Grade Level(s): 11 or 12 (36 weeks, 280 hours)

Prerequisite(s): Auto Body Repair I–Non-Certified 8679

In the global automotive repair industry there is a growing demand for qualified auto body technicians. In this course, students are taught to repair, mask, and refinish auto body components and entire vehicles. In addition, they use spray guns and personal safety equipment while applying undercoats and topcoats, working with a variety of materials, and gaining career skills. The cooperative education method is available for this course. Students combine classroom instruction and supervised on-the-job training in an approved position with continuing supervision throughout the school year.

Concentration Sequences (a combination of the course above and those below, equivalent to two 36-week courses) **Students wishing to complete a specialization may take additional courses appropriate to their career pathways.**	**Career Cluster(s) for federal reporting (choose one)**	**Available Credentials upon Completion of the Above Course**
• Automotive Body Repair I–Non-Certified 8679	Transportation, Distribution and Logistics	See Section 10 for a listing of applicable credentials (by course name or credential name).

Automotive Body Repair III–Non-Certified 8681

Suggested Grade Level(s): 12 (36 weeks, 280 hours)

Prerequisite(s): Auto Body Repair II–Non-Certified 8680

This course allows students to further apply the tasks/competencies learned in Auto Body Repair I and II. This course may also be used as a capstone course in which students may perfect their auto body skills and move toward employment in the industry. The cooperative education method is available for this course. Students combine classroom instruction and supervised on-the-job training in an approved position with continuing supervision throughout the school year.

Concentration Sequences (a combination of the course above and those below, equivalent to two 36-week courses) **Students wishing to complete a specialization may take additional courses appropriate to their career pathways.**	**Career Cluster(s) for federal reporting (choose one)**	**Available Credentials upon Completion of the Above Course**
This course may be offered as a complement to an existing concentration sequence.	Transportation, Distribution and Logistics	See Section 10 for a listing of applicable credentials (by course name or credential name).

Automotive Body Technology I–Certified 8676

Suggested Grade Level(s): 10 or 11 (36 weeks, minimum 140 hours)

In the global automotive repair industry, there is a growing demand for qualified auto body technicians. In this course, students are taught non-structural analysis, damage repair, and welding. Students work with a variety of materials, using metal finishing and body filling techniques to prepare surfaces and repair panels. In addition, students practice shop safety and gain career skills. Students who successfully complete this program sequence will be prepared to take and pass the respective ASE/NATEF exam and will be prepared for postsecondary education opportunities.

Concentration Sequences (a combination of the course above and those below, equivalent to two 36-week courses) **Students wishing to complete a specialization may take additional courses appropriate to their career pathways.**	**Career Cluster(s) for federal reporting (choose one)**	**Available Credentials upon Completion of the Above Course**
• Automotive Body Technology II–Certified 8677	Transportation, Distribution and Logistics	See Section 10 for a listing of applicable credentials (by course name or credential name).

Automotive Body Technology II–Certified 8677

Suggested Grade Level(s): 11 or 12 (36 weeks, 280 hours)

Prerequisite(s): Auto Body Technology I–Certified 8676

In the global automotive repair industry there is a growing demand for qualified auto body technicians. In this course, students are taught to repair, mask, and refinish auto body components and entire vehicles. In addition, they use spray guns and personal safety equipment while applying undercoats and topcoats, working with a variety of materials, and gaining career skills. Students who successfully complete this program sequence will be prepared to take and pass the respective ASE/NATEF exam and will be prepared for postsecondary education opportunities. The cooperative education method is available for this course. Students combine classroom instruction and supervised on-the-job training in an approved position with continuing supervision throughout the school year.

Concentration Sequences (a combination of the course above and those below, equivalent to two 36-week courses) **Students wishing to complete a specialization may take additional courses appropriate to their career pathways.**	**Career Cluster(s) for federal reporting (choose one)**	**Available Credentials upon Completion of the Above Course**
• Automotive Body Technology I–Certified 8676	Transportation, Distribution and Logistics	See Section 10 for a listing of applicable credentials (by course name or credential name).

Automotive Body Technology III–Certified 8678

Suggested Grade Level(s): 12 (36 weeks, 280 hours)

Prerequisite(s): Auto Body Technology II–Certified 8677

This course allows students to further apply the tasks/competencies learned in Auto Body Technology I and II. This course may also be used as a capstone course in which students may perfect their auto body skills and move toward employment in the industry. Students who successfully complete this program sequence will be prepared to take and pass the respective ASE/NATEF exam and will be prepared for postsecondary education opportunities. The cooperative education method is available for this course. Students combine classroom instruction and supervised on-the-job training in an approved position with continuing supervision throughout the school year.

Concentration Sequences (a combination of the course above and those below, equivalent to two 36-week courses) **Students wishing to complete a specialization may take additional courses appropriate to their career pathways.**	**Career Cluster(s) for federal reporting (choose one)**	**Available Credentials upon Completion of the Above Course**
This course may be offered as a complement to an existing concentration sequence.	Transportation, Distribution and Logistics	See Section 10 for a listing of applicable credentials (by course name or credential name).

Automotive Maintenance 8709

Suggested Grade Level(s): 10 or 11 (36 weeks)

Students enrolled in this course learn basic skills associated with routine automotive servicing in the areas of engine tune-up, minor electrical repair, lubrication, cooling systems, brakes, fuel systems, suspension, tire and wheel repair, detailing, and state of Virginia safety inspection procedures. This one-year course is a great choice for anyone interested in gaining a basic introduction to the automotive industry.

Concentration Sequences (a combination of the course above and those below, equivalent to two 36-week courses) **Students wishing to complete a specialization may take additional courses appropriate to their career pathways.**	**Career Cluster(s) for federal reporting (choose one)**	**Available Credentials upon Completion of the Above Course**
This course may be offered as a complement to an existing concentration sequence.	Transportation, Distribution and Logistics	See Section 10 for a listing of applicable credentials (by course name or credential name).

Automotive Servicing I–Non-Certified 8710

Suggested Grade Level(s): 10 or 11 (36 weeks)

In this first course of the three-course program sequence, students learn all aspects of repair, safety, and customer service by concentrating on four primary areas: brakes, steering and suspension, electrical/electronics, and engine performance. Students get a taste of real-world scenarios while being encouraged to enter into postsecondary education opportunities.

Concentration Sequences (a combination of the course above and those below, equivalent to two 36-week courses) **Students wishing to complete a specialization may take additional courses appropriate to their career pathways.**	**Career Cluster(s) for federal reporting (choose one)**	**Available Credentials upon Completion of the Above Course**
• Automotive Servicing II–Non-Certified 8711	Transportation, Distribution and Logistics	See Section 10 for a listing of applicable credentials (by course name or credential name).

Automotive Servicing II–Non-Certified 8711

Suggested Grade Level(s): 11 or 12 (36 weeks)

Prerequisite(s): Auto Servicing I–Non-Certified 8710

In this second course of the three-course program sequence, students learn all aspects of repair, safety, and customer service by concentrating on four primary areas: brakes, steering and suspension, electrical/electronics, and engine performance. Students will get a taste of real-world scenarios while being encouraged to enter into postsecondary education opportunities. The cooperative education method is available for this course. Students combine classroom instruction and supervised on-the-job training in an approved position with continuing supervision throughout the school year.

Concentration Sequences (a combination of the course above and those below, equivalent to two 36-week courses) **Students wishing to complete a specialization may take additional courses appropriate to their career pathways.**	**Career Cluster(s) for federal reporting (choose one)**	**Available Credentials upon Completion of the Above Course**
• Automotive Servicing I–Non-Certified 8710	Transportation, Distribution and Logistics	See Section 10 for a listing of applicable credentials (by course name or credential name).

Automotive Servicing III–Non-Certified 8712

Suggested Grade Level(s): 12 (36 weeks)

Prerequisite(s): Auto Servicing II–Non-Certified 8711

In this third course of the three-course program sequence, students master all aspects of repair, safety, and customer service by concentrating on four primary areas: brakes, steering and suspension, electrical/electronics, and engine performance. Students will get a taste of real-world scenarios while being encouraged to enter into postsecondary education opportunities. **Note:** The cooperative education method is available for this course. Students combine classroom instruction and supervised on-the-job training in an approved position with continuing supervision throughout the school year.

Concentration Sequences (a combination of the course above and those below, equivalent to two 36-week courses) **Students wishing to complete a specialization may take additional courses appropriate to their career pathways.**	**Career Cluster(s) for federal reporting (choose one)**	**Available Credentials upon Completion of the Above Course**
This course may be offered as a complement to an existing concentration sequence.	Transportation, Distribution and Logistics	See Section 10 for a listing of applicable credentials (by course name or credential name).

Automotive Technology I–Certified 8506

Suggested Grade Level(s): 10 or 11 (36 weeks, minimum 140 hours)

In this first course of the three-course program sequence, students learn all aspects of repair, safety, and customer service by concentrating on the four primary ASE/NATEF certified areas: brakes, steering and suspension, electrical/electronics, and engine performance. Students who successfully complete this program sequence will be prepared to take and pass the respective ASE/NATEF exam and will be prepared for postsecondary education opportunities.

Concentration Sequences (a combination of the course above and those below, equivalent to two 36-week courses) **Students wishing to complete a specialization may take additional courses appropriate to their career pathways.**	**Career Cluster(s) for federal reporting (choose one)**	**Available Credentials upon Completion of the Above Course**
• Automotive Technology II–Certified 8507	Transportation, Distribution and Logistics	See Section 10 for a listing of applicable credentials (by course name or credential name).

Automotive Technology II–Certified 8507

Suggested Grade Level(s): 11 or 12 (36 weeks, 280 hours)

Prerequisite(s): Auto Technology I–Certified 8506

In this second course of the three-course program sequence, students learn all aspects of repair, safety, and customer service by concentrating on the four primary ASE/NATEF certified areas: brakes, steering and suspension, electrical/electronics, and engine performance. Students who successfully complete this program sequence will be prepared to take and pass the respective ASE/NATEF exam and will be prepared for postsecondary education opportunities. The cooperative education method is available for this course. Students combine classroom instruction and supervised on-the-job training in an approved position with continuing supervision throughout the school year.

Concentration Sequences (a combination of the course above and those below, equivalent to two 36-week courses) **Students wishing to complete a specialization may take additional courses appropriate to their career pathways.**	**Career Cluster(s) for federal reporting (choose one)**	**Available Credentials upon Completion of the Above Course**
• Automotive Technology I–Certified 8506	Transportation, Distribution and Logistics	See Section 10 for a listing of applicable credentials (by course name or credential name).

Automotive Technology III–Certified 8508

Suggested Grade Level(s): 12 (36 weeks, 280 hours)

Prerequisite(s): Auto Technology II–Certified 8507

In this third course of the three-course program sequence, students master all aspects of repair, safety, and customer service by concentrating on the four primary ASE/NATEF certified areas: brakes, steering and suspension, electrical/electronics, and engine performance. Students who successfully complete this program sequence will be prepared to take and pass the respective ASE/NATEF exam and will be prepared for postsecondary education opportunities.

Concentration Sequences (a combination of the course above and those below, equivalent to two 36-week courses) **Students wishing to complete a specialization may take additional courses appropriate to their career pathways.**	**Career Cluster(s) for federal reporting (choose one)**	**Available Credentials upon Completion of the Above Course**
This course may be offered as a complement to an existing concentration sequence.	Transportation, Distribution and Logistics	See Section 10 for a listing of applicable credentials (by course name or credential name).

Aviation Maintenance Technology I 8728

Suggested Grade Level(s): 11 (36 weeks, minimum 140 hours)

Students study aircraft systems and components, technical diagrams and charts, aerodynamics, basic electricity, and electronics as specified by FAA requirements.

Concentration Sequences (a combination of the course above and those below, equivalent to two 36-week courses) **Students wishing to complete a specialization may take additional courses appropriate to their career pathways.**	**Career Cluster(s) for federal reporting (choose one)**	**Available Credentials upon Completion of the Above Course**
• Aviation Maintenance Technology II 8729	Transportation, Distribution and Logistics	See Section 10 for a listing of applicable credentials (by course name or credential name).

Aviation Maintenance Technology II 8729

Suggested Grade Level(s): 12 (36 weeks, 280 hours)

Prerequisite(s): Aviation Maintenance Technology I 8728

Students continue to study aircraft systems and components, technical diagrams and charts, aerodynamics, basic electricity, and electronics as specified by FAA requirements. The cooperative education method is available for this course. Students combine classroom instruction and supervised on-the-job training in an approved position with continuing supervision throughout the school year.

Concentration Sequences (a combination of the course above and those below, equivalent to two 36-week courses) **Students wishing to complete a specialization may take additional courses appropriate to their career pathways.**	**Career Cluster(s) for federal reporting (choose one)**	**Available Credentials upon Completion of the Above Course**
• Aviation Maintenance Technology I 8728	Transportation, Distribution and Logistics	See Section 10 for a listing of applicable credentials (by course name or credential name).

Barbering I 8740

Suggested Grade Level(s): 10 or 11 (36 weeks, 280 hours)

Barbering is the study of hair, scalp, and skin. Students study and prepare in a clinical lab setting, using mannequins and live models for manipulative practice. The program emphasizes safety and sanitation, communication, and management skills. Related areas of study include psychology, ethics, and professional image. Competency completions prepare the students to work or apprentice in a local barber shop or beauty salon.

Concentration Sequences (a combination of the course above and those below, equivalent to two 36-week courses) **Students wishing to complete a specialization may take additional courses appropriate to their career pathways.**	**Career Cluster(s) for federal reporting (choose one)**	**Available Credentials upon Completion of the Above Course**
• Barbering II 8741	Human Services	See Section 10 for a listing of applicable credentials (by course name or credential name).

Barbering II 8741

Suggested Grade Level(s): 11 or 12 (36 weeks, 280 hours)

Prerequisite(s): Barbering I 8740

Students apply their knowledge of barbering skills in a clinical lab setting, using mannequins and live models for manipulative practice. The program emphasizes safety and sanitation, communication skills, and management of a barber shop or beauty salon. Related areas of study include psychology, ethics, and professional image. Competency completions prepare the students for the Virginia state licensing exam. The cooperative education method is available for this course. Students combine classroom instruction and supervised on-the-job training in an approved position with continuing supervision throughout the school year.

Concentration Sequences (a combination of the course above and those below, equivalent to two 36-week courses) **Students wishing to complete a specialization may take additional courses appropriate to their career pathways.**	**Career Cluster(s) for federal reporting (choose one)**	**Available Credentials upon Completion of the Above Course**
• Barbering I 8740	Human Services	See Section 10 for a listing of applicable credentials (by course name or credential name).

Barbering III 8742 (This course is in transition.)

Basic Automotive Body Repair 8675

Suggested Grade Level(s): 10 or 11 (36 weeks)

Students learn fundamental skills associated with safe use of hand and power tools and the use of spray guns to refinish the modern automobile.

Concentration Sequences (a combination of the course above and those below, equivalent to two 36-week courses) **Students wishing to complete a specialization may take additional courses appropriate to their career pathways.**	**Career Cluster(s) for federal reporting (choose one)**	**Available Credentials upon Completion of the Above Course**
This course may be offered as a complement to an existing concentration sequence.	Transportation, Distribution and Logistics	See Section 10 for a listing of applicable credentials (by course name or credential name).

Basic Carpentry 8600

Suggested Grade Level(s): 10 or 11 (36 weeks)

Students enrolled in this program learn fundamental skills associated with layout, framing, and construction materials and install wooden products.

Concentration Sequences (a combination of the course above and those below, equivalent to two 36-week courses) **Students wishing to complete a specialization may take additional courses appropriate to their career pathways.**	**Career Cluster(s) for federal reporting (choose one)**	**Available Credentials upon Completion of the Above Course**
This course may be offered as a complement to an existing concentration sequence.	Architecture and Construction	See Section 10 for a listing of applicable credentials (by course name or credential name).

Basic Photography 8610

Suggested Grade Level(s): 10 or 11 (36 weeks)

Students enrolled in this program will learn photographic skills such as using multiple camera formats to set up, shoot, process and present photographic images; creating images using digital technology and preparing a professional portfolio to prepare for a career in the field of photography.

Concentration Sequences (a combination of the course above and those below, equivalent to two 36-week courses) **Students wishing to complete a specialization may take additional courses appropriate to their career pathways.**	**Career Cluster(s) for federal reporting (choose one)**	**Available Credentials upon Completion of the Above Course**
This course may be offered as a complement to an existing concentration sequence.	Arts, Audio/Video Technology and Communications	See Section 10 for a listing of applicable credentials (by course name or credential name).

Beauty Salon Assistant 8546

Suggested Grade Level(s): 10 or 11 (36 weeks)

The Beauty Salon Assistant course prepares students for work as an assistant in a hair salon. Students study and prepare in a clinical lab setting, learning practical and manipulative skills. The program emphasizes safety and sanitation, shampooing and conditioning, retailing, inventory control, and receptionist work. Competency completions allow students a certificate for entry-level employment. The cooperative education method is available for this course. Students combine classroom instruction and supervised on-the-job training in an approved position with continuing supervision throughout the school year.

Concentration Sequences (a combination of the course above and those below, equivalent to two 36-week courses) **Students wishing to complete a specialization may take additional courses appropriate to their career pathways.**	**Career Cluster(s) for federal reporting (choose one)**	**Available Credentials upon Completion of the Above Course**
This course may be offered as a complement to an existing concentration sequence.	Human Services	See Section 10 for a listing of applicable credentials (by course name or credential name).

Bricklayer 8549

Suggested Grade Level(s): 10 or 11 (36 weeks)

Students enrolled in this program learn the fundamental skills associated with laying block and brick. The cooperative education method is available for this course. Students combine classroom instruction and supervised on-the-job training in an approved marketing position with continuing supervision throughout the school year.

Concentration Sequences (a combination of the course above and those below, equivalent to two 36-week courses) **Students wishing to complete a specialization may take additional courses appropriate to their career pathways.**	**Career Cluster(s) for federal reporting (choose one)**	**Available Credentials upon Completion of the Above Course**
This course may be offered as a complement to an existing concentration sequence.	Architecture and Construction	See Section 10 for a listing of applicable credentials (by course name or credential name).

Building Management I 8590

Suggested Grade Level(s): 10 or 11 (36 weeks, minimum 140 hours)

Students obtain the knowledge and skills to perform the upkeep of commercial and public buildings and grounds through hands-on training in cleaning operations, building repairs, plumbing, and grounds maintenance.

Concentration Sequences (a combination of the course above and those below, equivalent to two 36-week courses) **Students wishing to complete a specialization may take additional courses appropriate to their career pathways.**	**Career Cluster(s) for federal reporting (choose one)**	**Available Credentials upon Completion of the Above Course**
• Building Management II 8591	Hospitality and Tourism	See Section 10 for a listing of applicable credentials (by course name or credential name).

Building Management II 8591

Suggested Grade Level(s): 11 or 12 (36 weeks, 280 hours)

Prerequisite(s): Building Management I 8590

Students obtain advanced knowledge and skills to perform the upkeep of commercial and public buildings and grounds through hands-on training in cleaning operations, building repairs, plumbing, and grounds maintenance. The cooperative education method is available for this course. Students combine classroom instruction and supervised on-the-job training in an approved position with continuing supervision throughout the school year.

Concentration Sequences (a combination of the course above and those below, equivalent to two 36-week courses) **Students wishing to complete a specialization may take additional courses appropriate to their career pathways.**	**Career Cluster(s) for federal reporting (choose one)**	**Available Credentials upon Completion of the Above Course**
• Building Management I 8590	Hospitality and Tourism	See Section 10 for a listing of applicable credentials (by course name or credential name).

Building Management III 8592

Prerequisite(s): Building Management II 8591

Suggested Grade Level(s): 12 (36 weeks, 280 hours)

Building Management III is offered as a capstone course for high school. Students apply the knowledge and skills to perform advanced maintenance and upkeep of commercial and public buildings and grounds through specific hands-on training in cleaning operations, building repairs, plumbing, and grounds maintenance. The cooperative education method is available for this course. Students combine classroom instruction and supervised on-the-job training in an approved position with continuing supervision throughout the school year.

Concentration Sequences (a combination of the course above and those below, equivalent to two 36-week courses) **Students wishing to complete a specialization may take additional courses appropriate to their career pathways.**	**Career Cluster(s) for federal reporting (choose one)**	**Available Credentials upon Completion of the Above Course**
This course may be offered as a complement to an existing concentration sequence.	Hospitality and Tourism	See Section 10 for a listing of applicable credentials (by course name or credential name).

Building Trades I 8515

Suggested Grade Level(s): 10 or 11 (36 weeks, minimum 140 hours)

Building Trades I prepares students to erect, install, maintain, and repair buildings, and other structures using materials such as metal, wood, stone, brick, glass, concrete and composition substances. Students focus on developing skills in core safety and the masonry, carpentry, electricity, and plumbing professions.

Concentration Sequences (a combination of the course above and those below, equivalent to two 36-week courses) **Students wishing to complete a specialization may take additional courses appropriate to their career pathways.**	**Career Cluster(s) for federal reporting (choose one)**	**Available Credentials upon Completion of the Above Course**
• Building Trades II 8516	Architecture and Construction	See Section 10 for a listing of applicable credentials (by course name or credential name).

Building Trades II 8516

Suggested Grade Level(s): 11 or 12 (36 weeks, 280 hours)

Prerequisite(s): Building Trades I 8515

Building Trades II continues to prepare students to erect, install, maintain, and repair buildings, and other structures using materials such as metal, wood, stone, brick, glass, concrete, and composition substances. Students focus on mastering skills in core safety and the masonry, carpentry, electricity, and plumbing professions. The cooperative education method is available for this course. Students combine classroom instruction and supervised on-the-job training in an approved position with continuing supervision throughout the school year.

Concentration Sequences (a combination of the course above and those below, equivalent to two 36-week courses) **Students wishing to complete a specialization may take additional courses appropriate to their career pathways.**	**Career Cluster(s) for federal reporting (choose one)**	**Available Credentials upon Completion of the Above Course**
• Building Trades I 8515	Architecture and Construction	See Section 10 for a listing of applicable credentials (by course name or credential name).

Building Trades III 8517 (This course is in transition.)

Cabinetmaking I 8604

Suggested Grade Level(s): 10 or 11 (36 weeks, minimum 140 hours)

Students learn workshop and tool safety and employability skills as they practice reading blueprints; estimating and selecting materials; cutting and shaping stock; assembling, fastening, and installing components; and finishing surfaces. The technical, problem-solving, leadership, and creative skills learned in Cabinetmaking can be applied in industries well beyond construction trades and professions and can prepare the student for lifelong learning and success.

Concentration Sequences (a combination of the course above and those below, equivalent to two 36-week courses) **Students wishing to complete a specialization may take additional courses appropriate to their career pathways.**	**Career Cluster(s) for federal reporting (choose one)**	**Available Credentials upon Completion of the Above Course**
• Cabinetmaking II 8605	Architecture and Construction	See Section 10 for a listing of applicable credentials (by course name or credential name).

Cabinetmaking II 8605

Suggested Grade Level(s): 11 or 12 (36 weeks, 280 hours)

Prerequisite(s): Cabinetmaking I 8604

Students continue to learn workshop and tool safety and enhance their employability skills as they interpret blueprints; estimate and select materials; cut and shape stock; assemble, fasten, and install components; install interior finishes; apply wood veneers and plastic laminates; finish surfaces; and transport and install cabinets. The technical, problem-solving, leadership, and creative skills learned in Cabinetmaking can be applied in industries well beyond construction trades and professions and can prepare the student for lifelong learning and success. The cooperative education method is available for this course. Students combine classroom instruction and supervised on-the-job training in an approved position with continuing supervision throughout the school year.

Concentration Sequences (a combination of the course above and those below, equivalent to two 36-week courses) **Students wishing to complete a specialization may take additional courses appropriate to their career pathways.**	**Career Cluster(s) for federal reporting (choose one)**	**Available Credentials upon Completion of the Above Course**
• Cabinetmaking I 8604	Architecture and Construction	See Section 10 for a listing of applicable credentials (by course name or credential name).

Cabinetmaking III 8606 (This course is in transition.)

Carpentry I 8601

Suggested Grade Level(s): 10 or 11 (36 weeks, minimum 140 hours)

Carpentry I introduces students to skills essential to success in the profession. Students use hand and power tools to cut stock; learn to read blueprints; build and install foundations, trusses, doors, windows, stairs, and finishes; and frame walls, floors, ceilings, roofs, decks, and porches. All students will obtain a required OSHA 10 Safety Credential in the class.

Concentration Sequences (a combination of the course above and those below, equivalent to two 36-week courses) **Students wishing to complete a specialization may take additional courses appropriate to their career pathways.**	**Career Cluster(s) for federal reporting (choose one)**	**Available Credentials upon Completion of the Above Course**
• Carpentry II 8602	Architecture and Construction	See Section 10 for a listing of applicable credentials (by course name or credential name).

Carpentry II 8602

Suggested Grade Level(s): 11 or 12 (36 weeks, 280 hours)

Prerequisite(s): Carpentry I 8601

Carpentry II completes students' secondary training for the carpentry profession. Students study blueprints; build and install foundations, trusses, doors, windows, stairs, and finishes; and frame walls, floors, ceilings, roofs, decks, and porches. In addition, students are introduced to basic rigging, learn to estimate and select building materials, and install cabinets. The cooperative education method is available for this course. Students combine classroom instruction and supervised on-the-job training in an approved position with continuing supervision throughout the school year.

Concentration Sequences (a combination of the course above and those below, equivalent to two 36-week courses) **Students wishing to complete a specialization may take additional courses appropriate to their career pathways.**	**Career Cluster(s) for federal reporting (choose one)**	**Available Credentials upon Completion of the Above Course**
• Carpentry I 8601	Architecture and Construction	See Section 10 for a listing of applicable credentials (by course name or credential name).

Carpentry III 8603

Suggested Grade Level(s): 12 (36 weeks, 280 hours)

Prerequisite(s): Carpentry II 8602

This course prepares students for success in the carpentry profession. Students use hand and power tools to cut stock; build and install foundations, trusses, doors, windows, stairs, and finishes; study blueprints; and frame walls, floors, ceilings, roofs, decks, and porches. In addition, students are introduced to basic rigging, learn to estimate and select building materials, and install cabinets. The cooperative education method is available for this course. Students combine classroom instruction and supervised on-the-job training in an approved position with continuing supervision throughout the school year.

Concentration Sequences (a combination of the course above and those below, equivalent to two 36-week courses) **Students wishing to complete a specialization may take additional courses appropriate to their career pathways.**	**Career Cluster(s) for federal reporting (choose one)**	**Available Credentials upon Completion of the Above Course**
This course may be offered as a complement to an existing concentration sequence.	Architecture and Construction	See Section 10 for a listing of applicable credentials (by course name or credential name).

Commercial Photography I 8607

Suggested Grade Level(s): 10 or 11(36 weeks, minimum 140 hours)

Students learn to operate digital and film cameras and related equipment, including lenses, filters, and light meters. Instructional topics include composition, exposure calculations, and preparing finished photographs (film and digital). In addition, students evaluate and critique photographic work and investigate the history of photography.

Concentration Sequences (a combination of the course above and those below, equivalent to two 36-week courses) **Students wishing to complete a specialization may take additional courses appropriate to their career pathways.**	**Career Cluster(s) for federal reporting (choose one)**	**Available Credentials upon Completion of the Above Course**
• Commercial Photography II 8608	Arts, Audio/Video Technology and Communications	See Section 10 for a listing of applicable credentials (by course name or credential name).

Commercial Photography II 8608

Suggested Grade Level(s): 11 or 12 (36 weeks, 280 hours)

Prerequisite(s): Commercial Photography I 8607

Students gain in-depth knowledge of camera operation, including 35mm, medium-format, and view cameras. Instructional topics include photo composition, the Zone System for optimal exposure, color theory, and studio and portrait photography. Students analyze photographic works and offer critiques. Additionally, they explore careers in photography and develop a portfolio. The cooperative education method is available for this course. Students combine classroom instruction and supervised on-the-job training in an approved position with continuing supervision throughout the school year.

Concentration Sequences (a combination of the course above and those below, equivalent to two 36-week courses) **Students wishing to complete a specialization may take additional courses appropriate to their career pathways.**	**Career Cluster(s) for federal reporting (choose one)**	**Available Credentials upon Completion of the Above Course**
• Commercial Photography I 8607	Arts, Audio/Video Technology and Communications	See Section 10 for a listing of applicable credentials (by course name or credential name).

Commercial Photography III 8609 (This course is in transition.)

Computer Maintenance 8621

Suggested Grade Level(s): 10 or 11 (36 weeks)

Students enrolled in this course learn fundamental skills associated with maintenance of computers.

Concentration Sequences (a combination of the course above and those below, equivalent to two 36-week courses) **Students wishing to complete a specialization may take additional courses appropriate to their career pathways.**	**Career Cluster(s) for federal reporting (choose one)**	**Available Credentials upon Completion of the Above Course**
This course may be offered as a complement to an existing concentration sequence.	Information Technology	See Section 10 for a listing of applicable credentials (by course name or credential name).

Computer Networking Hardware Operations I 8542

Suggested Grade Level(s): 10, 11, 12 (18 weeks)

This course teaches students the skills needed to obtain entry-level home network installer jobs. It also helps students develop some of the skills needed to become network technicians, computer technicians, cable installers, and help-desk technicians. It provides a hands-on introduction to networking and the Internet, using tools and hardware commonly found in home and small business environments. Instructors are encouraged to facilitate field trips and outside-the-classroom learning experiences. Labs include PC installation, Internet connectivity, wireless connectivity, file and print sharing, and the installation of game consoles, scanners, and cameras.

Concentration Sequences (a combination of the course above and those below, equivalent to two 36-week courses) **Students wishing to complete a specialization may take additional courses appropriate to their career pathways.**	**Career Cluster(s) for federal reporting (choose one)**	**Available Credentials upon Completion of the Above Course**
• Computer Networking Hardware Operations II 8543 • Computer Networking Hardware Operations III 8544 • Computer Networking Hardware Operations IV 8545	Information Technology	See Section 10 for a listing of applicable credentials (by course name or credential name).

Computer Networking Hardware Operations II 8543

Suggested Grade Level(s): 10, 11, 12 (18 weeks)

Prerequisite(s): Computer Networking Hardware Operations I 8542

This course prepares students for jobs as network technicians and helps them develop additional skills required for computer technicians and help desk technicians. It provides a basic overview of routing and remote access, addressing, and security. It also familiarizes students with servers that provide e-mail services, Web space, and authenticated access. Students learn about the soft skills required for help desk and customer service positions, and the final chapter helps them prepare for the CCENT certification exam. Network monitoring and basic troubleshooting skills are taught in context. The cooperative education method is available for this course. Students combine classroom instruction and supervised on-the-job training in an approved position with continuing supervision throughout the school year.

Concentration Sequences (a combination of the course above and those below, equivalent to two 36-week courses) **Students wishing to complete a specialization may take additional courses appropriate to their career pathways.**	**Career Cluster(s) for federal reporting (choose one)**	**Available Credentials upon Completion of the Above Course**
• Computer Networking Hardware Operations I 8542 • Computer Networking Hardware Operations III 8544 • Computer Networking Hardware Operations IV 8545	Information Technology	See Section 10 for a listing of applicable credentials (by course name or credential name).

Computer Networking Hardware Operations III 8544

Suggested Grade Level(s): 10, 11, 12 (18 weeks)

Prerequisite(s): Computer Networking Hardware Operations II 8543

This course familiarizes students with the equipment applications and protocols installed in enterprise networks, with a focus on switched networks, IP Telephony requirements, and security. It also introduces advanced routing protocols such as Enhanced Interior Gateway Routing Protocol (EIGRP) and Open Shortest Path First (OSPF) Protocol. Hands-on exercises, including configuration, installation, and troubleshooting, reinforce student learning. The cooperative education method is available for this course. Students combine classroom instruction and supervised on-the-job training in an approved position with continuing supervision throughout the school year.

Concentration Sequences (a combination of the course above and those below, equivalent to two 36-week courses) **Students wishing to complete a specialization may take additional courses appropriate to their career pathways.**	**Career Cluster(s) for federal reporting (choose one)**	**Available Credentials upon Completion of the Above Course**
• Computer Networking Hardware Operations I 8542 • Computer Networking Hardware Operations II 8543 • Computer Networking Hardware Operations IV 8545	Information Technology	See Section 10 for a listing of applicable credentials (by course name or credential name).

Computer Networking Hardware Operations IV 8545

Suggested Grade Level(s): 10, 11, 12 (18 weeks)

Prerequisite(s): Computer Networking Hardware Operations III 8544

This course introduces students to network design processes using two examples; a large stadium enterprise network and a medium-sized film company network. Students follow a standard design process to expand and upgrade each network, which includes requirements gathering, proof-of-concept, and project management. Lifecycle services, including upgrades, competitive analyses, and system integration, are presented in the context of pre-sale support. In addition to the Packet Tracer and lab exercises found in the previous courses, there are many pen-and-paper and role-playing exercises that students complete while developing their network upgrade proposals. The cooperative education method is available for this course. Students combine classroom instruction and supervised on-the-job training in an approved position with continuing supervision throughout the school year.

Concentration Sequences (a combination of the course above and those below, equivalent to two 36-week courses) **Students wishing to complete a specialization may take additional courses appropriate to their career pathways.**	**Career Cluster(s) for federal reporting (choose one)**	**Available Credentials upon Completion of the Above Course**
• Computer Networking Hardware Operations I 8542 • Computer Networking Hardware Operations II 8543 • Computer Networking Hardware Operations III 8544	Information Technology	See Section 10 for a listing of applicable credentials (by course name or credential name).

Computer Systems Technology I 8622

Suggested Grade Level(s): 10, 11, 12 (36 weeks)

Students enter the world of computer technology and gain practical experience in assembling a computer system, installing an operating system, and troubleshooting computers and peripherals, using system tools and diagnostic software. They develop skills in computer networking and resource sharing. In addition, students explore the relationships between internal and external computer components. Emphasis is placed on customer service skills and career exploration. Upon successful completion of the course, students may qualify to take the A+ certification exam.

Concentration Sequences (a combination of the course above and those below, equivalent to two 36-week courses) **Students wishing to complete a specialization may take additional courses appropriate to their career pathways.**	**Career Cluster(s) for federal reporting (choose one)**	**Available Credentials upon Completion of the Above Course**
• Computer Systems Technology II 8623	Information Technology	See Section 10 for a listing of applicable credentials (by course name or credential name).

Computer Systems Technology II 8623

Suggested Grade Level(s): 11 or 12 (36 weeks)

Prerequisite(s): Computer Systems Technology I 8622

Building on the foundation of Computer Systems Technology I, this advanced course provides students with training in procedures for optimizing and troubleshooting concepts for computer systems and subsystems. Students explore wireless technologies such as Bluetooth and Wi-Fi and create and configure a network. Emphasis is placed on technical proficiency, skill-building, and workplace readiness. The course prepares students for postsecondary education and training and a successful career in information technology. Upon successful completion of the course, students may qualify to take the A+ certification. The cooperative education method is available for this course. Students combine classroom instruction and supervised on-the-job training in an approved position with continuing supervision throughout the school year.

Concentration Sequences (a combination of the course above and those below, equivalent to two 36-week courses) **Students wishing to complete a specialization may take additional courses appropriate to their career pathways.**	**Career Cluster(s) for federal reporting (choose one)**	**Available Credentials upon Completion of the Above Course**
• Computer Systems Technology I 8622	Information Technology	See Section 10 for a listing of applicable credentials (by course name or credential name).

Computer Systems Technology III 8624 (This course is in transition.)

Cosmetology I 8527

Suggested Grade Level(s): 10 or 11 (36 weeks, 280 hours)

In this introductory course, students study hair, skin, and nails and their related care. Students are grounded in theory as they prepare to practice procedures in a clinical lab setting or classroom, using mannequins for manipulative skill practice. The first-year course emphasizes personal safety, professionalism, and sanitation of equipment and facilities. Students develop skills in shampooing and conditioning hair as well as styling and cutting hair. They also receive an introduction to manicure and pedicure procedures.

Concentration Sequences (a combination of the course above and those below, equivalent to two 36-week courses) **Students wishing to complete a specialization may take additional courses appropriate to their career pathways.**	**Career Cluster(s) for federal reporting (choose one)**	**Available Credentials upon Completion of the Above Course**
• Cosmetology II 8528	Human Services	See Section 10 for a listing of applicable credentials (by course name or credential name).

Cosmetology II 8528

Suggested Grade Level(s): 11 or 12 (36 weeks, 280 hours)

Prerequisite(s): Cosmetology I 8527

In this advanced course, students build on their theoretical foundation in cosmetology and increase proficiency in hair cutting and styling on live models, with attention to professionalism, client consultation, safety, and sanitation. Students are trained in safety and chemical processes related to permanent waves, relaxing, soft-curling, lightening, and coloring hair. They also develop artistic skills with artificial hair. In addition, students learn to care for skin, hands, and feet, developing expertise in providing facials, manicures, and pedicures. A business management unit focuses on managing the salon. Competency completions prepare the student for the Virginia state-licensing exam. The cooperative education method is available for this course. Students combine classroom instruction and supervised on-the-job training in an approved position with continuing supervision throughout the school year.

Concentration Sequences (a combination of the course above and those below, equivalent to two 36-week courses) **Students wishing to complete a specialization may take additional courses appropriate to their career pathways.**	**Career Cluster(s) for federal reporting (choose one)**	**Available Credentials upon Completion of the Above Course**
• Cosmetology I 8527	Human Services	See Section 10 for a listing of applicable credentials (by course name or credential name).

Cosmetology III 8529 (This course is in transition.)

Criminal Justice I 8702

Suggested Grade Level(s): 10 or 11 (36 weeks)

Students are introduced to the principles, techniques, and practices for pursuing careers within the criminal justice services system.

Concentration Sequences (a combination of the course above and those below, equivalent to two 36-week courses) **Students wishing to complete a specialization may take additional courses appropriate to their career pathways.**	**Career Cluster(s) for federal reporting (choose one)**	**Available Credentials upon Completion of the Above Course**
• Criminal Justice II 8703	Law, Public Safety, Corrections and Security	See Section 10 for a listing of applicable credentials (by course name or credential name).

Criminal Justice II 8703

Suggested Grade Level(s): 11 or 12 (36 weeks)

Prerequisite(s): Criminal Justice I 8702

Students learn the principles, techniques, and practices for pursuing careers within the criminal justice services system. The cooperative education method is available for this course. Students combine classroom instruction and supervised on-the-job training in an approved position with continuing supervision throughout the school year.

Concentration Sequences (a combination of the course above and those below, equivalent to two 36-week courses) **Students wishing to complete a specialization may take additional courses appropriate to their career pathways.**	**Career Cluster(s) for federal reporting (choose one)**	**Available Credentials upon Completion of the Above Course**
• Criminal Justice I 8702	Law, Public Safety, Corrections and Security	See Section 10 for a listing of applicable credentials (by course name or credential name).

Criminal Justice III 8704 (This course is in transition.)

Diesel Equipment Technology I 8613

Suggested Grade Level(s): 10 or 11 (36 weeks, minimum 140 hours)

Students receive basic instruction in general maintenance and overhaul of diesel equipment. They learn to inspect, maintain, and repair tracks, wheels, brakes, operating controls, pneumatic and hydraulic systems, electrical circuitry, and engines. They practice welding and brazing techniques.

Concentration Sequences (a combination of the course above and those below, equivalent to two 36-week courses) **Students wishing to complete a specialization may take additional courses appropriate to their career pathways.**	**Career Cluster(s) for federal reporting (choose one)**	**Available Credentials upon Completion of the Above Course**
• Diesel Equipment Technology II 8614	Transportation, Distribution and Logistics	See Section 10 for a listing of applicable credentials (by course name or credential name).

Diesel Equipment Technology II 8614

Suggested Grade Level(s): 11 or 12 (36 weeks, 280 hours)

Prerequisite(s): Diesel Equipment Technology I 8613

Students receive instruction in general maintenance and overhaul of diesel equipment. They learn to inspect, maintain, and repair tracks, wheels, brakes, operating controls, pneumatic and hydraulic systems, electrical circuitry, and engines. They practice welding and brazing techniques. The cooperative education method is available for this course. Students combine classroom instruction and supervised on-the-job training in an approved position with continuing supervision throughout the school year.

Concentration Sequences (a combination of the course above and those below, equivalent to two 36-week courses) **Students wishing to complete a specialization may take additional courses appropriate to their career pathways.**	**Career Cluster(s) for federal reporting (choose one)**	**Available Credentials upon Completion of the Above Course**
• Diesel Equipment Technology I 8613	Transportation, Distribution and Logistics	See Section 10 for a listing of applicable credentials (by course name or credential name).

Diesel Equipment Technology III 8615 (This course is in transition.)

Drafting I 8530

Suggested Grade Level(s): 10 or 11 (36 weeks, minimum 140 hours)

Students are introduced to the theory and the manipulative skills necessary to produce and complete accurate drawings based on the ideas and sketches of engineers, architects, and designers. Students practice the fundamentals of design and prepare mechanical, structural, and architectural plans, using basic CADD operations.

Concentration Sequences (a combination of the course above and those below, equivalent to two 36-week courses) **Students wishing to complete a specialization may take additional courses appropriate to their career pathways.**	**Career Cluster(s) for federal reporting (choose one)**	**Available Credentials upon Completion of the Above Course**
• Drafting II 8531	Architecture and Construction	See Section 10 for a listing of applicable credentials (by course name or credential name).

Drafting II 8531

Suggested Grade Level(s): 11 or 12 (36 weeks, 280 hours)

Prerequisite(s): Drafting I 8530

Students master the theory and the manipulative skills necessary to produce complete and accurate drawings based on the ideas and sketches of engineers, architects, and designers. They design and prepare mechanical, structural, and architectural plans, electronics, transmitters, power supplies, and receivers relevant to consumer electronic products as they practice electronic product troubleshooting, servicing, and safety procedures. The cooperative education method is available for this course. Students combine classroom instruction and supervised on-the-job training in an approved position with continuing supervision throughout the school year.

Concentration Sequences (a combination of the course above and those below, equivalent to two 36-week courses) **Students wishing to complete a specialization may take additional courses appropriate to their career pathways.**	**Career Cluster(s) for federal reporting (choose one)**	**Available Credentials upon Completion of the Above Course**
• Drafting I 8530	Architecture and Construction	See Section 10 for a listing of applicable credentials (by course name or credential name).

Drafting III 8532 (This course is in transition.)

Electricity I 8533

Suggested Grade Level(s): 10 or 11 (36 weeks, minimum 140 hours)

Students develop skills in the installation, operation, maintenance, and repair of residential, commercial, and industrial electrical systems. They also study electrical theory, navigate the National Electrical Code Book, select and install conductors, and work with panelboards, switchboards, and generators.

Concentration Sequences (a combination of the course above and those below, equivalent to two 36-week courses) **Students wishing to complete a specialization may take additional courses appropriate to their career pathways.**	**Career Cluster(s) for federal reporting (choose one)**	**Available Credentials upon Completion of the Above Course**
• Electricity II 8534	Architecture and Construction	See Section 10 for a listing of applicable credentials (by course name or credential name).

Electricity II 8534

Suggested Grade Level(s): 11 or 12 (36 weeks, 280 hours)

Prerequisite(s): Electricity I 8533

Students continue to develop skills in the installation, operation, maintenance, and repair of residential, commercial, and industrial electrical systems. They also study electrical theory and mathematical problems related to electricity, navigate the National Electrical Code Book, select and install conductors, examine lighting, communication, and power systems, and work with conduit and raceways, panelboards, switchboards, grounding systems, and generators. The cooperative education method is available for this course. Students combine classroom instruction and supervised on-the-job training in an approved position with continuing supervision throughout the school year.

Concentration Sequences (a combination of the course above and those below, equivalent to two 36-week courses) **Students wishing to complete a specialization may take additional courses appropriate to their career pathways.**	**Career Cluster(s) for federal reporting (choose one)**	**Available Credentials upon Completion of the Above Course**
• Electricity I 8533	Architecture and Construction	See Section 10 for a listing of applicable credentials (by course name or credential name).

Electricity III 8535

Suggested Grade Level(s): 12 (36 weeks, 280 hours)

Prerequisite(s): Electricity II 8534

Students master skills in the installation, operation, maintenance, and repair of residential, commercial, and industrial electrical systems. They also study electrical theory and mathematical problems related to electricity, navigate the National Electrical Code Book, select and install conductors, examine lighting, communication, and power systems, and work with conduit and raceways, panelboards, switchboards, grounding systems, and generators. The cooperative education method is available for this course. Students combine classroom instruction and supervised on-the-job training in an approved position with continuing supervision throughout the school year.

Concentration Sequences (a combination of the course above and those below, equivalent to two 36-week courses) **Students wishing to complete a specialization may take additional courses appropriate to their career pathways.**	**Career Cluster(s) for federal reporting (choose one)**	**Available Credentials upon Completion of the Above Course**
This course may be offered as a complement to an existing concentration sequence.	Architecture and Construction	See Section 10 for a listing of applicable credentials (by course name or credential name).

Electronics Technology I 8536

Suggested Grade Level(s): 10 or 11 (36 weeks, minimum 140 hours)

Students learn to assemble, install, operate, maintain, repair, and troubleshoot electrical/electronic equipment used in industry and manufacturing. Digital and computer circuitry, synchro- and servomechanisms, mechanical power transfer systems, three-phase alternate current and electronic wave shaping are included in this program.

Concentration Sequences (a combination of the course above and those below, equivalent to two 36-week courses) **Students wishing to complete a specialization may take additional courses appropriate to their career pathways.**	**Career Cluster(s) for federal reporting (choose one)**	**Available Credentials upon Completion of the Above Course**
• Electronics Technology II	Science, Technology, Engineering, and Mathematics	See Section 10 for a listing of applicable credentials (by course name or credential name).

Electronics Technology II 8537

Suggested Grade Level(s): 11 or 12 (36 weeks, 280 hours)

Prerequisite(s): Electronics Technology I 8536

Students continue to learn to assemble, install, operate, maintain, repair, and troubleshoot electrical/electronic equipment used in industry and manufacturing. Digital and computer circuitry, synchro- and servomechanisms, mechanical power transfer systems, three-phase alternate current and electronic wave shaping are included in this program. The cooperative education method is available for this course. Students combine classroom instruction and supervised on-the-job training in an approved position with continuing supervision throughout the school year.

Concentration Sequences (a combination of the course above and those below, equivalent to two 36-week courses) **Students wishing to complete a specialization may take additional courses appropriate to their career pathways.**	**Career Cluster(s) for federal reporting (choose one)**	**Available Credentials upon Completion of the Above Course**
• Electronics Technology I	Science, Technology, Engineering and Mathematics	See Section 10 for a listing of applicable credentials (by course name or credential name).

Electronics Technology III 8538

Suggested Grade Level(s): 12 (36 weeks, 280 hours)

Prerequisite(s): Electronics Technology II 8537

Students master the skills necessary to assemble, install, operate, maintain, repair, and troubleshoot electrical/electronic equipment used in industry and manufacturing. Digital and computer circuitry, synchro- and servomechanisms, mechanical power transfer systems, three-phase alternate current and electronic wave shaping are included in this program. The cooperative education method is available for this course. Students combine classroom instruction and supervised on-the-job training in an approved position with continuing supervision throughout the school year.

Concentration Sequences (a combination of the course above and those below, equivalent to two 36-week courses) **Students wishing to complete a specialization may take additional courses appropriate to their career pathways.**	**Career Cluster(s) for federal reporting (choose one)**	**Available Credentials upon Completion of the Above Course**
This course may be offered as a complement to an existing concentration sequence.	Science, Technology, Engineering and Mathematics	See Section 10 for a listing of applicable credentials (by course name or credential name).

Entrepreneurship Education 9094

Grade Level(s): 11 or 12 (36 weeks)

This course is designed for students who wish to concentrate on strategies for career development through ownership/management of their own businesses. Although individual skills are emphasized, the focus of the course is on development of a business plan, including the following: Determination of type of business enterprise, legal considerations, location selection, financing, steps in getting the enterprise started, marketing strategy, and interaction with successful entrepreneurs. The cooperative education method is available for this course. Students combine classroom instruction and supervised on-the-job training in an approved position with continuing supervision throughout the school year.

Note: Entrepreneurship Education, a Career Connections course, may be offered as a complement to an existing concentration sequence in any CTE program area. In some instances, where noted, it may be combined with specific courses to create concentration sequences.

Exploring Entrepreneurship 9093

Suggested Grade Level(s): 9, 10, 11, 12 (18 weeks)

Students explore qualities of individual enterprise, or the art of succeeding in a career. They develop skills needed to advance in an ever-changing work environment. Specifically, students develop competencies in decision making, long-range planning, effective communication, accountability, responsibility, and continuing education.

Note: Exploring Entrepreneurship, a Career Connections course, may be offered as a complement to an existing concentration sequence in any CTE program area. In some instances, where noted, it may be combined with specific courses to create concentration sequences.

Firefighting I 8705

Suggested Grade Level(s): 10 or 11 (36 weeks)

Students are introduced to the equipment and procedures necessary to fight live fires, operate in simulated hazardous-materials incidents, and conduct search-and-rescue operations. Students react to multi-faceted situations (e.g., caused by simulated terrorism, accidents, and natural disasters) as part of an emergency-response team. Students become familiar with emerging technologies such as communications software (e.g., dispatch systems, GIS, mapping systems, incident reporting, and simulation programs), multimedia inputs, thermal imaging cameras, and hazardous gas detectors. Students acquire teamwork, critical-thinking, public-speaking, research, report-writing, and incident-management skills. This course challenges students academically, mentally, and physically.

Note: Students must be at least 16 years old by the first day of the course offering.

Concentration Sequences **(a combination of the course above and those below, equivalent to two 36-week courses)** **Students wishing to complete a specialization may take additional courses appropriate to their career pathways.**	**Career Cluster(s) for federal reporting (choose one)**	**Available Credentials upon Completion of the Above Course**
• Firefighting II 8706	Law, Public Safety, Corrections and Security	See Section 10 for a listing of applicable credentials (by course name or credential name).

Firefighting II 8706

Suggested Grade Level(s): 11 or 12 (36 weeks)

Prerequisite(s): Firefighting I 8705

Students are introduced to the equipment and procedures necessary to fight live fires, operate in simulated hazardous-materials incidents, and conduct rescue operations including vehicle extrication. Students react to multi-faceted situations (e.g., caused by simulated terrorism, accidents, and natural disasters) by managing resources such as medivac helicopters, emergency medical personnel, technical rescue teams, and community-based organizations. Students become familiar with emerging technologies such as communications software (e.g., dispatch systems, GIS, mapping systems, incident reporting, and simulation programs), multimedia inputs, thermal imaging cameras, and hazardous gas detectors. Students acquire teamwork, critical-thinking, public-speaking, research, report-writing, and incident-management skills. This course challenges students academically, mentally, and physically. The cooperative education method is available for this course. Students combine classroom instruction and supervised on-the-job training in an approved position with continuing supervision throughout the school year.

Note: Students must be at least 16 years old by the first day of the course offering.

Concentration Sequences **(a combination of the course above and those below, equivalent to two 36-week courses)** **Students wishing to complete a specialization may take additional courses appropriate to their career pathways.**	**Career Cluster(s) for federal reporting (choose one)**	**Available Credentials upon Completion of the Above Course**
• Firefighting I 8705	Law, Public Safety, Corrections and Security	See Section 10 for a listing of applicable credentials (by course name or credential name).

Graphic Imaging Technology I 8660

Suggested Grade Level(s): 10 or 11 (36 weeks, minimum 140 hours)

Graphic Imaging Technology I introduces students to what has traditionally been called the printing industry. Students gain an overview of digital file preparation, image capture, color theory, digital file output, press operations, and bindery operations. Students learn to practice workplace safety and develop skills in measurement, mathematical problem solving, interpersonal communication, and the job application process. Graphic Imaging Technology programs may be certified by PrintED, the certification agency for Printing Industries of America.

Concentration Sequences (a combination of the course above and those below, equivalent to two 36-week courses) **Students wishing to complete a specialization may take additional courses appropriate to their career pathways.**	**Career Cluster(s) for federal reporting (choose one)**	**Available Credentials upon Completion of the Above Course**
• Graphic Imaging Technology II 8706	Arts, Audio/Video Technology and Communications	See Section 10 for a listing of applicable credentials (by course name or credential name).

Graphic Imaging Technology II 8661

Suggested Grade Level(s): 11 or 12 (36 weeks, 280 hours)

Prerequisite(s): Graphic Imaging Technology I 8660

Graphic Imaging Technology II prepares students for a career in what has traditionally been called the printing industry. Students gain knowledge and skills in offset press operations and digital file preparation. Graphic Imaging Technology programs may be certified by PrintED, the certification agency for Printing Industries of America. The cooperative education method is available for this course. Students combine classroom instruction and supervised on-the-job training in an approved position with continuing supervision throughout the school year.

Concentration Sequences (a combination of the course above and those below, equivalent to two 36-week courses) **Students wishing to complete a specialization may take additional courses appropriate to their career pathways.**	**Career Cluster(s) for federal reporting (choose one)**	**Available Credentials upon Completion of the Above Course**
• Graphic Imaging Technology I 8660	Arts, Audio/Video Technology and Communications	See Section 10 for a listing of applicable credentials (by course name or credential name).

Graphic Imaging Technology III 8662 (This course is in transition.)

Heating, Ventilation, Air Conditioning, and Refrigeration I 8503

Suggested Grade Level(s): 10 or 11 (36 weeks, minimum 140 hours)

This instructional program prepares students to install, repair, and maintain the operating conditions of heating, air conditioning, and refrigeration systems. Students work with piping and tubing, study heat and electricity, install duct systems, and comply with EPA regulations. Completion of this sequence may prepare students for a number of certification exams, helpful for employment in a variety of HVAC occupations.

Concentration Sequences (a combination of the course above and those below, equivalent to two 36-week courses) **Students wishing to complete a specialization may take additional courses appropriate to their career pathways.**	**Career Cluster(s) for federal reporting (choose one)**	**Available Credentials upon Completion of the Above Course**
• Heating, Ventilation, Air Conditioning, and Refrigeration II 8504	Science, Technology, Engineering, and Mathematics	See Section 10 for a listing of applicable credentials (by course name or credential name).

Heating, Ventilation, Air Conditioning, and Refrigeration II 8504

Suggested Grade Level(s): 11 or 12 (36 weeks, 280 hours)

Prerequisite(s): Heating, Ventilation, Air Conditioning, and Refrigeration I 8503

This instructional program prepares students to install, repair, and maintain the operating conditions of heating systems. Completion of this sequence may prepare students for a number of certification exams, helpful for employment in a variety of HVAC occupations. The cooperative education method is available for this course. Students combine classroom instruction and supervised on-the-job training in an approved position with continuing supervision throughout the school year.

Concentration Sequences (a combination of the course above and those below, equivalent to two 36-week courses) **Students wishing to complete a specialization may take additional courses appropriate to their career pathways.**	**Career Cluster(s) for federal reporting (choose one)**	**Available Credentials upon Completion of the Above Course**
• Heating, Ventilation, Air Conditioning, and Refrigeration I 8503	Science, Technology, Engineering, and Mathematics	See Section 10 for a listing of applicable credentials (by course name or credential name).

Heating, Ventilation, Air Conditioning, and Refrigeration III 8505 (This course is in transition.)

Industrial Cooperative Training I (non co-op) 8901

Suggested Grade Level(s): 10 (36 weeks, minimum 140 hours)

Students have the opportunity to prepare for employment related to the many fields within the areas of trade, industrial, or technical occupations. Each student receives on-the-job training and instruction related to his or her chosen trade area.

Concentration Sequences (a combination of the course above and those below, equivalent to two 36-week courses) **Students wishing to complete a specialization may take additional courses appropriate to their career pathways.**	**Career Cluster(s) for federal reporting (choose one)**	**Available Credentials upon Completion of the Above Course**
This course may be offered as a complement to an existing concentration sequence.	Choose the cluster most closely aligned to the content of the course.	See Section 10 for a listing of applicable credentials (by course name or credential name).

Industrial Cooperative Training II (co-op) 8902

Suggested Grade Level(s): 11 or 12 (36 weeks, 280 hours)

Prerequisite(s): Industrial Cooperative Training I (non co-op) 8901

Students have the opportunity to prepare for employment related to the many fields within the areas of trade, industrial, or technical occupations. Each student receives on-the-job training and instruction related to his or her chosen trade area.

Concentration Sequences (a combination of the course above and those below, equivalent to two 36-week courses) **Students wishing to complete a specialization may take additional courses appropriate to their career pathways.**	**Career Cluster(s) for federal reporting (choose one)**	**Available Credentials upon Completion of the Above Course**
• ICT III (co-op) 8903	Choose the cluster most closely aligned to the content of the course.	See Section 10 for a listing of applicable credentials (by course name or credential name).

Industrial Cooperative Training III (co-op) 8903

Suggested Grade Level(s): 12 (36 weeks, 280 hours)

Students have the opportunity to prepare for employment related to the many fields within the areas of trade, industrial, or technical occupations. Each student receives on-the-job training and instruction related to his or her chosen trade area.

Concentration Sequences (a combination of the course above and those below, equivalent to two 36-week courses) **Students wishing to complete a specialization may take additional courses appropriate to their career pathways.**	**Career Cluster(s) for federal reporting (choose one)**	**Available Credentials upon Completion of the Above Course**
• ICT II (co-op) 8902	Choose the cluster most closely aligned to the content of the course.	See Section 10 for a listing of applicable credentials (by course name or credential name).

Industrial Cooperative Training (SIP) Senior Intensified Program (co-op) 8904

Suggested Grade Level(s): 12 (36 weeks)

Students have the opportunity to prepare for employment related to the many fields within the areas of trade, industrial, or technical occupations. Each student receives on-the-job training and instruction related to his or her chosen trade area. The ICT Senior Intensified Program (SIP) can be operated as an extension of any day-trade program.

Concentration Sequences (a combination of the course above and those below, equivalent to two 36-week courses) **Students wishing to complete a specialization may take additional courses appropriate to their career pathways.**	**Career Cluster(s) for federal reporting (choose one)**	**Available Credentials upon Completion of the Above Course**
This course may be offered as a complement to an existing concentration sequence.	Choose the cluster most closely aligned to the content of the course.	See Section 10 for a listing of applicable credentials (by course name or credential name).

Industrial Maintenance Technology I 8575

Suggested Grade Level(s): 10 or 11(36 weeks)

Students are taught safety skills and precision measurement skills, and are introduced to the hand and power tools used to perform adjustments, to maintain systems, and to perform milling, turning, and welding operations.

Concentration Sequences (a combination of the course above and those below, equivalent to two 36-week courses) **Students wishing to complete a specialization may take additional courses appropriate to their career pathways.**	**Career Cluster(s) for federal reporting (choose one)**	**Available Credentials upon Completion of the Above Course**
• Industrial Maintenance Technology II 8576	Manufacturing	See Section 10 for a listing of applicable credentials (by course name or credential name).

Industrial Maintenance Technology II 8576

Suggested Grade Level(s): 11 or 12 (36 weeks)

Prerequisite(s): Industrial Maintenance Technology I 8575

Students increase their skills in working with systems maintenance, milling operations, turning operations, welding, technical drawings, and quality control. The cooperative education method is available for this course. Students combine classroom instruction and supervised on-the-job training in an approved position with continuing supervision throughout the school year.

Concentration Sequences (a combination of the course above and those below, equivalent to two 36-week courses) **Students wishing to complete a specialization may take additional courses appropriate to their career pathways.**	**Career Cluster(s) for federal reporting (choose one)**	**Available Credentials upon Completion of the Above Course**
• Industrial Maintenance Technology I 8575	Arts, Audio/Video Technology and Communications	See Section 10 for a listing of applicable credentials (by course name or credential name).

Industrial Maintenance Technology III 8577 (This course is in transition.)

Introduction to Leadership 9091

Suggested Grade Level(s): 9 or 10 (18 weeks)

This course equips students with individual and group leadership skills. Course content includes leadership principles, officer training, parliamentary law, public speaking, effective communication, positive public relations skills, and techniques of organizing and conducting group meetings and activities. Students are encouraged to be active members of a community or school organization.

Note: Introduction to Leadership, a Career Connections course, may be offered as a complement to an existing concentration sequence in any CTE program area. In some instances, where noted, it may be combined with specific courses to create concentration sequences.

Leadership Development 9096

Suggested Grade Level(s): 11 or 12 (18 weeks)

Leadership Development 9097

Suggested Grade Level(s): 11 or 12 (36 weeks)

Students develop competencies in identifying individual aptitudes in relation to effective leadership skills, understanding organizational behavior, using effective communication in the workplace, handling human resources and organizational problems, supervising and training employees, resolving conflict, and planning for the future. Continuing education in leadership is emphasized as well as practical leadership experiences in cooperation with school and community leaders.

Note: Leadership Development, a Career Connections course, may be offered as a complement to an existing concentration sequence in any CTE program area. In some instances, where noted, it may be combined with specific courses to create concentration sequences.

Marine Service Technology I 8750

Suggested Grade Level(s): 10 or 11 (36 weeks, minimum 140 hours)

In this introduction to service and repair of watercraft and marina operations, students learn marine trade skills in areas including shop and boating safety, inboard and outboard systems, carpentry, electricity, and vessel storage/handling. The course is based on the National Marine Trades Curriculum, developed by the American Boat and Yacht Council (ABYC).

Concentration Sequences **(a combination of the course above and those below, equivalent to two 36-week courses)** **Students wishing to complete a specialization may take additional courses appropriate to their career pathways.**	**Career Cluster(s) for federal reporting (choose one)**	**Available Credentials upon Completion of the Above Course**
• Marine Service Technology II 8751	Transportation, Distribution and Logistics	See Section 10 for a listing of applicable credentials (by course name or credential name).

Marine Service Technology II 8751

Suggested Grade Level(s): 11 or 12 (36 weeks, 280 hours)

Prerequisite(s): Marine Service Technology I 8750

This course completes students' introduction to service and repair of watercraft and marina operations. Students gain entry-level marine trade skills in areas including inboard and outboard systems, carpentry, fiberglass construction and repair, electricity, welding, vessel storage/handling, and tools and equipment operation. The course is based on the National Marine Trades Curriculum, developed by the American Boat and Yacht Council (ABYC). Successful completers will receive a certificate from the ABYC. The cooperative education method is available for this course. Students combine classroom instruction and supervised on-the-job training in an approved position with continuing supervision throughout the school year.

Concentration Sequences (a combination of the course above and those below, equivalent to two 36-week courses) **Students wishing to complete a specialization may take additional courses appropriate to their career pathways.**	**Career Cluster(s) for federal reporting (choose one)**	**Available Credentials upon Completion of the Above Course**
• Marine Service Technology I 8750	Transportation, Distribution and Logistics	See Section 10 for a listing of applicable credentials (by course name or credential name).

Marine Service Technology III 8752 (This course is in transition.)

Masonry I 8512

Suggested Grade Level(s): 10 or 11 (36 weeks, minimum 140 hours)

Students learn to use hand tools such as trowels, levels, and chisels and power tools such as concrete mixers to lay brick, concrete block, tile, and related materials. Students focus on problem-solving and employability skills while performing entry-level brick masonry tasks.

Concentration Sequences (a combination of the course above and those below, equivalent to two 36-week courses) **Students wishing to complete a specialization may take additional courses appropriate to their career pathways.**	**Career Cluster(s) for federal reporting (choose one)**	**Available Credentials upon Completion of the Above Course**
• Masonry II 8513	Architecture and Construction	See Section 10 for a listing of applicable credentials (by course name or credential name).

Masonry II 8513

Suggested Grade Level(s): 11 or 12 (36 weeks, 280 hours)

Prerequisite(s): Masonry I 8512

Students continue to use hand tools such as trowels, levels, and chisels and power tools such as concrete mixers to lay brick, concrete block, tile, and related materials. Students also perform residential and commercial masonry tasks. The cooperative education method is available for this course. Students combine classroom instruction and supervised on-the-job training in an approved position with continuing supervision throughout the school year.

Concentration Sequences (a combination of the course above and those below, equivalent to two 36-week courses) **Students wishing to complete a specialization may take additional courses appropriate to their career pathways.**	**Career Cluster(s) for federal reporting (choose one)**	**Available Credentials upon Completion of the Above Course**
• Masonry I 8512	Architecture and Construction	See Section 10 for a listing of applicable credentials (by course name or credential name).

Masonry III 8514

Suggested Grade Level(s): 12 (36 weeks, 280 hours)

Prerequisite(s): Masonry II 8513

Students master the use of hand tools such as trowels, levels, and chisels and power tools such as concrete mixers to lay brick, concrete block, tile, and related materials. Students perform residential and commercial masonry tasks and prepare the building site to perform advanced masonry tasks. The cooperative education method is available for this course. Students combine classroom instruction and supervised on-the-job training in an approved position with continuing supervision throughout the school year.

Concentration Sequences (a combination of the course above and those below, equivalent to two 36-week courses) **Students wishing to complete a specialization may take additional courses appropriate to their career pathways.**	**Career Cluster(s) for federal reporting (choose one)**	**Available Credentials upon Completion of the Above Course**
This course may be offered as a complement to an existing concentration sequence.	Architecture and Construction	See Section 10 for a listing of applicable credentials (by course name or credential name).

Motorsports Technology I 8509

Suggested Grade Level(s): 10 or 11 (36 weeks, minimum 140 hours)

Motorsports Technology I provides a foundation in the principles of racecar fabrication and all facets of the racing industry. Technical aspects of the course include skill development in vehicle assembly using specialty tools and welding. Students explore the motorsports technology industry and identify careers in the field.

Concentration Sequences (a combination of the course above and those below, equivalent to two 36-week courses) **Students wishing to complete a specialization may take additional courses appropriate to their career pathways.**	**Career Cluster(s) for federal reporting (choose one)**	**Available Credentials upon Completion of the Above Course**
• Motorsports Technology II 8510	Transportation, Distribution and Logistics	See Section 10 for a listing of applicable credentials (by course name or credential name).

Motorsports Technology II 8510

Suggested Grade Level(s): 11 or 12 (36 weeks, 280 hours)

Prerequisite(s): Motorsports Technology I 8509

Motorsports Technology II further develops students' skills in racecar fabrication as they explore the motorsports technology industry. Students gain experience in chassis preparation, vehicle assembly, and engine assembly and disassembly. Additional focus areas include racing protocol and regulatory compliance in the motorsports field. The cooperative education method is available for this course. Students combine classroom instruction and supervised on-the-job training in an approved position with continuing supervision throughout the school year.

Concentration Sequences (a combination of the course above and those below, equivalent to two 36-week courses) **Students wishing to complete a specialization may take additional courses appropriate to their career pathways.**	**Career Cluster(s) for federal reporting (choose one)**	**Available Credentials upon Completion of the Above Course**
• Motorsports Technology I 8509	Transportation, Distribution and Logistics	See Section 10 for a listing of applicable credentials (by course name or credential name).

Motorsports Technology III 8511

Suggested Grade Level(s): 12 (36 weeks, 280 hours)

Prerequisite(s): Motorsports Technology II 8510

In Motorsports Technology III, students develop advanced skills as they prepare for careers in motorsports technology and the racing industry. Students gain practical experience in vehicle setup, vehicle assembly, and autobody procedures. Emphasis is placed on assembly of high-performance engines and components. In addition, students explore motorsports safety principles and the business aspects of the motorsports industry. The cooperative education method is available for this course. Students combine classroom instruction and supervised on-the-job training in an approved position with continuing supervision throughout the school year.

Concentration Sequences (a combination of the course above and those below, equivalent to two 36-week courses) **Students wishing to complete a specialization may take additional courses appropriate to their career pathways.**	**Career Cluster(s) for federal reporting (choose one)**	**Available Credentials upon Completion of the Above Course**
This course may be offered as a complement to an existing concentration sequence.	Transportation, Distribution and Logistics	See Section 10 for a listing of applicable credentials (by course name or credential name).

Nail Technician I 8692

Suggested Grade Level(s): 10 or 11 (36 weeks)

Students learn to manicure, pedicure, install and maintain artificial nails, and apply concepts associated with bacteriology, sanitation, nail disorders, anatomy and physiology, and safety. Completion prepares students for the Virginia state licensing examination in Nail Technician.

Concentration Sequences (a combination of the course above and those below, equivalent to two 36-week courses) **Students wishing to complete a specialization may take additional courses appropriate to their career pathways.**	**Career Cluster(s) for federal reporting (choose one)**	**Available Credentials upon Completion of the Above Course**
• Nail Technician II 8693	Human Services	See Section 10 for a listing of applicable credentials (by course name or credential name).

Nail Technician II 8693

Suggested Grade Level(s): 11 or 12 (36 weeks)

Prerequisite(s): Nail Technician I 8692

Students learn to manicure, pedicure, install and maintain artificial nails, and apply concepts associated with bacteriology, sanitation, nail disorders, anatomy and physiology, and safety. Program completion prepares students for the Virginia state licensing examination in Nail Technician. The cooperative education method is available for this course. Students combine classroom instruction and supervised on-the-job training in an approved position with continuing supervision throughout the school year.

Concentration Sequences (a combination of the course above and those below, equivalent to two 36-week courses) **Students wishing to complete a specialization may take additional courses appropriate to their career pathways.**	**Career Cluster(s) for federal reporting (choose one)**	**Available Credentials upon Completion of the Above Course**
• Nail Technician I 8692	Human Services	See Section 10 for a listing of applicable credentials (by course name or credential name).

Plumbing I 8551

Suggested Grade Level(s): 10 or 11 (36 weeks, minimum 140 hours)

Students learn to safely assemble, install, and repair pipes and fittings, and are introduced to installing fixtures of heating, water, and drainage systems, according to specification and plumbing codes.

Concentration Sequences (a combination of the course above and those below, equivalent to two 36-week courses) **Students wishing to complete a specialization may take additional courses appropriate to their career pathways.**	**Career Cluster(s) for federal reporting (choose one)**	**Available Credentials upon Completion of the Above Course**
• Plumbing II 8552	Architecture and Construction	See Section 10 for a listing of applicable credentials (by course name or credential name).

Plumbing II 8552

Suggested Grade Level(s): 11 or 12 (36 weeks, 280 hours)

Prerequisite(s): Plumbing I 8551

Students learn to safely assemble, install, and repair pipes, fittings, and fixtures of heating, water, and drainage systems, according to specification and plumbing codes. The cooperative education method is available for this course. Students combine classroom instruction and supervised on-the-job training in an approved position with continuing supervision throughout the school year.

Concentration Sequences (a combination of the course above and those below, equivalent to two 36-week courses) **Students wishing to complete a specialization may take additional courses appropriate to their career pathways.**	**Career Cluster(s) for federal reporting (choose one)**	**Available Credentials upon Completion of the Above Course**
• Plumbing I 8551	Architecture and Construction	See Section 10 for a listing of applicable credentials (by course name or credential name).

Plumbing III 8553 (This course is in transition.)

Precision Machining Technology I 8539

Suggested Grade Level(s): 10 or 11 (36 weeks, minimum 140 hours)

Students learn the basics of industrial safety and environmental protection; planning, management, and performance of machining jobs; quality control; general maintenance; engineering drawings and sketches; and application of measurements, metalworking theory, properties of materials, and principles of CNC. Precision Machining Technology programs may be certified by NTMA (National Tooling and Machining Association), the certifying agency for the National Institute for Metalworking Skills (NIMS).

Concentration Sequences (a combination of the course above and those below, equivalent to two 36-week courses) **Students wishing to complete a specialization may take additional courses appropriate to their career pathways.**	**Career Cluster(s) for federal reporting (choose one)**	**Available Credentials upon Completion of the Above Course**
• Precision Machining Technology II 8540	Manufacturing	See Section 10 for a listing of applicable credentials (by course name or credential name).

Precision Machining Technology II 8540

Suggested Grade Level(s): 11 or 12 (36 weeks, 280 hours)

Prerequisite(s): Precision Machining Technology I 8539

Students apply industrial safety and environmental protection; planning, management, and performance of machining jobs; quality control; process improvement; general maintenance; engineering drawings and sketches; and application of measurements, metalworking theory, properties of materials, and principles of CNC. Precision Machining Technology programs may be certified by NTMA (National Tooling and Machining Association), the certifying agency for the National Institute for Metalworking Skills (NIMS). The cooperative education method is available for this course. Students combine classroom instruction and supervised on-the-job training in an approved position with continuing supervision throughout the school year.

Concentration Sequences (a combination of the course above and those below, equivalent to two 36-week courses) **Students wishing to complete a specialization may take additional courses appropriate to their career pathways.**	**Career Cluster(s) for federal reporting (choose one)**	**Available Credentials upon Completion of the Above Course**
• Precision Machining Technology I 8539	Manufacturing	See Section 10 for a listing of applicable credentials (by course name or credential name).

Precision Machining Technology III 8541 (This course is in transition.)

Public Safety I 8700

Suggested Grade Level(s): 11 or 12 (36 weeks, minimum 140 hours)

Students perform procedures related to law enforcement and firefighting occupations, including learning the history of the criminal justice system; policing skills; the rule of law; crime scene investigation; the role of the courts; communications systems; first aid and CPR techniques; protective devices (e.g. sprinklers); the history and fundamentals of the fire service; rescue procedures; and procedures for using personal protective equipment (PPE), the self-contained breathing apparatus (SCBA), water supply, hoses, and nozzles.

Concentration Sequences (a combination of the course above and those below, equivalent to two 36-week courses) **Students wishing to complete a specialization may take additional courses appropriate to their career pathways.**	**Career Cluster(s) for federal reporting (choose one)**	**Available Credentials upon Completion of the Above Course**
• Public Safety II 8701	Law, Public Safety, Corrections and Security	See Section 10 for a listing of applicable credentials (by course name or credential name).

Public Safety II 8701

Suggested Grade Level(s): 12 (36 weeks, 280 hours)

Prerequisite(s): Public Safety I 8700

Students perform procedures related to law enforcement and firefighting occupations, including learning policing; the rule of law; the role of the courts, including juvenile justice; the history and fundamentals of the fire service; fire behavior; building construction; ventilation; salvage, overhaul, and cause of fire; the value of fire prevention and public fire education programs; fire suppression techniques; forcible entry methods; HazMat standards; and equipment related to firefighting and criminal justice. The cooperative education method is available for this course. Students combine classroom instruction and supervised on-the-job training in an approved position with continuing supervision throughout the school year.

Note: Students must be at least 16 years old by the first day of the course offering.

Concentration Sequences (a combination of the course above and those below, equivalent to two 36-week courses) **Students wishing to complete a specialization may take additional courses appropriate to their career pathways.**	**Career Cluster(s) for federal reporting (choose one)**	**Available Credentials upon Completion of the Above Course**
• Public Safety I 8700	Law, Public Safety, Corrections and Security	See Section 10 for a listing of applicable credentials (by course name or credential name).

Radio Communications I 8640

Suggested Grade Level(s): 10 or 11 (36 weeks, minimum 140 hours)

Students learn practices related to the management and operation of a broadcasting station. Students are introduced to the radio industry, news reporting, and broadcast engineering. Students learn basic electricity and electronics, including all aspects of safety as well as related mathematics. Activities provide the skills for obtaining a radiotelephone operator license.

Concentration Sequences (a combination of the course above and those below, equivalent to two 36-week courses) **Students wishing to complete a specialization may take additional courses appropriate to their career pathways.**	**Career Cluster(s) for federal reporting (choose one)**	**Available Credentials upon Completion of the Above Course**
• Radio Communications II 8641	Arts, Audio/Video Technology and Communications	See Section 10 for a listing of applicable credentials (by course name or credential name).

Radio Communications II 8641

Suggested Grade Level(s): 11 or 12 (36 weeks, 280 hours)

Prerequisite(s): Radio Communications I 8640

Students learn practices related to the management and operation of a broadcasting station. Students direct programming, perform on air, and analyze radio markets. Activities provide the skills for obtaining a radiotelephone operator license. The cooperative education method is available for this course. Students combine classroom instruction and supervised on-the-job training in an approved position with continuing supervision throughout the school year.

Concentration Sequences (a combination of the course above and those below, equivalent to two 36-week courses) **Students wishing to complete a specialization may take additional courses appropriate to their career pathways.**	**Career Cluster(s) for federal reporting (choose one)**	**Available Credentials upon Completion of the Above Course**
• Radio Communications I 8640	Arts, Audio/Video Technology and Communications	See Section 10 for a listing of applicable credentials (by course name or credential name).

Radio Communications III 8642 (This course is in transition.)

Robotic Workcell Technology I 8557

Suggested Grade Level(s): 10 or 11 (36 weeks, minimum 140 hours)

This course provides instruction in basic computer programming, electronics, motor control, and feedback systems used in assembly and manufacturing settings. In addition, students learn how to program a microcontroller for robotic manipulation.

Concentration Sequences (a combination of the course above and those below, equivalent to two 36-week courses) **Students wishing to complete a specialization may take additional courses appropriate to their career pathways.**	**Career Cluster(s) for federal reporting (choose one)**	**Available Credentials upon Completion of the Above Course**
• Robotic Workcell Technology II 8558	Science, Technology, Engineering and Mathematics	See Section 10 for a listing of applicable credentials (by course name or credential name).

Robotic Workcell Technology II 8558

Suggested Grade Level(s): 11 or 12 (36 weeks, 280 hours)

Prerequisite(s): Robotic Workcell Technology I 8557

This course provides advanced instruction in computer programming, electronics, motor control, and feedback systems used in assembly and manufacturing settings. In addition, students program a microcontroller for robotic manipulation. The cooperative education method is available for this course. Students combine classroom instruction and supervised on-the-job training in an approved position with continuing supervision throughout the school year.

Concentration Sequences (a combination of the course above and those below, equivalent to two 36-week courses) **Students wishing to complete a specialization may take additional courses appropriate to their career pathways.**	**Career Cluster(s) for federal reporting (choose one)**	**Available Credentials upon Completion of the Above Course**
• Robotic Workcell Technology I 8557	Science, Technology, Engineering and Mathematics	See Section 10 for a listing of applicable credentials (by course name or credential name).

Robotic Workcell Technology III 8559 (This course is in transition.)

Sheet Metal I 8663

Suggested Grade Level(s): 10 or 11 (36 weeks)

Students may work with materials that are cast, formed, shaped, molded, heat treated, cut, twisted, pressed, fused, or stamped. Instruction includes basic planning, manufacturing, assembling, testing, and repairing of mechanisms, machines, and structures.

Concentration Sequences (a combination of the course above and those below, equivalent to two 36-week courses) **Students wishing to complete a specialization may take additional courses appropriate to their career pathways.**	**Career Cluster(s) for federal reporting (choose one)**	**Available Credentials upon Completion of the Above Course**
• Sheet Metal II 8664	Manufacturing	See Section 10 for a listing of applicable credentials (by course name or credential name).

Sheet Metal II 8664

Suggested Grade Level(s): 11 or 12 (36 weeks)

Prerequisite(s): Sheet Metal I 8663

Students work with materials that are cast, formed, shaped, molded, heat treated, cut, twisted, pressed, fused, or stamped. Instruction includes the planning, manufacturing, assembling, testing, and repairing of mechanisms, machines, and structures. The cooperative education method is available for this course. Students combine classroom instruction and supervised on-the-job training in an approved position with continuing supervision throughout the school year.

Concentration Sequences (a combination of the course above and those below, equivalent to two 36-week courses) **Students wishing to complete a specialization may take additional courses appropriate to their career pathways.**	**Career Cluster(s) for federal reporting (choose one)**	**Available Credentials upon Completion of the Above Course**
• Sheet Metal I 8663	Manufacturing	See Section 10 for a listing of applicable credentials (by course name or credential name).

Sheet Metal III 8665 (This course is in transition.)

Small Engine Repair 8724

Suggested Grade Level(s): 10 or 11 (36 weeks)

Students enrolled in this program learn skills associated with general maintenance and repair of lawnmowers, rotary tillers, and portable power equipment.

Concentration Sequences (a combination of the course above and those below, equivalent to two 36-week courses) **Students wishing to complete a specialization may take additional courses appropriate to their career pathways.**	**Career Cluster(s) for federal reporting (choose one)**	**Available Credentials upon Completion of the Above Course**
This course may be offered as a complement to an existing concentration sequence.	Transportation, Distribution and Logistics	See Section 10 for a listing of applicable credentials (by course name or credential name).

Small Engine Technology I 8725

Suggested Grade Level(s): 10 or 11 (36 weeks, minimum 140 hours)

Students learn to safely maintain and repair small internal-combustion engines used on portable power equipment such as lawnmowers, string trimmers, rotary tillers, outboard engines, and other two- and four-cycle engines. Students diagnose and service manual starting systems, ignition systems, cooling systems, and exhaust systems.

Concentration Sequences (a combination of the course above and those below, equivalent to two 36-week courses) **Students wishing to complete a specialization may take additional courses appropriate to their career pathways.**	**Career Cluster(s) for federal reporting (choose one)**	**Available Credentials upon Completion of the Above Course**
• Small Engine Technology II 8726	Transportation, Distribution and Logistics	See Section 10 for a listing of applicable credentials (by course name or credential name).

Small Engine Technology II 8726

Suggested Grade Level(s): 11 or 12 (36 weeks, 280 hours)

Prerequisite(s): Small Engine Technology I 8725

Students learn to safely maintain and repair small internal-combustion engines used on portable power equipment such as chain saws, motorcycles, jet skis, all-terrain vehicles, outboard engines, and other two- and four-cycle engines. Students analyze causes of engine failure and perform shop operations. The cooperative education method is available for this course. Students combine classroom instruction and supervised on-the-job training in an approved position with continuing supervision throughout the school year.

Concentration Sequences (a combination of the course above and those below, equivalent to two 36-week courses) **Students wishing to complete a specialization may take additional courses appropriate to their career pathways.**	**Career Cluster(s) for federal reporting (choose one)**	**Available Credentials upon Completion of the Above Course**
• Small Engine Technology I 8725	Transportation, Distribution and Logistics	See Section 10 for a listing of applicable credentials (by course name or credential name).

Small Engine Technology III 8727 (This course is in transition.)

Telecommunications I 8650

Suggested Grade Level(s): 10 or 11 (36 weeks)

Students will learn about the technological and competitive advances now transforming the communications industry. This course will introduce students to the basic concepts and structural elements of voice, video, and data communications industry. Topics will include an introduction to signal transmission, attenuation, distortion, and signal propagation over cables, fiber, and air. User-premises based telecommunications platforms, switching, wiring, and networking, as well as facilities that provide and support telecommunications systems will be studied. Students will have the skills to become Certified Telecommunications Technicians, Satellite Technicians, and Certified Fiber Optics Technicians through Electronics Technicians Association International (ETA).

Concentration Sequences (a combination of the course above and those below, equivalent to two 36-week courses) **Students wishing to complete a specialization may take additional courses appropriate to their career pathways.**	**Career Cluster(s) for federal reporting (choose one)**	**Available Credentials upon Completion of the Above Course**
• Telecommunications II 8651	Arts, Audio/Video Technology and Communications	See Section 10 for a listing of applicable credentials (by course name or credential name).

Telecommunications II 8651

Suggested Grade Level(s): 11 or 12 (36 weeks)

Prerequisite(s): Telecommunications I 8650

Students will learn about the technological and competitive advances now transforming the communications industry. This course will introduce students to the basic concepts and structural elements of voice, video, and data communications industry. Topics will include an introduction to signal transmission, attenuation, distortion, and signal propagation over cables, fiber, and air. User-premises based telecommunications platforms, switching, wiring, and networking, as well as facilities that provide and support telecommunications systems will be studied. Students will have the skills to become Certified Telecommunications Technicians, Satellite Technicians, and Certified Fiber Optics Technicians through Electronics Technicians Association International (ETA). The cooperative education method is available for this course. Students combine classroom instruction and supervised on-the-job training in an approved position with continuing supervision throughout the school year.

Concentration Sequences (a combination of the course above and those below, equivalent to two 36-week courses) **Students wishing to complete a specialization may take additional courses appropriate to their career pathways.**	**Career Cluster(s) for federal reporting (choose one)**	**Available Credentials upon Completion of the Above Course**
• Telecommunications I 8650	Arts, Audio/Video Technology and Communications	See Section 10 for a listing of applicable credentials (by course name or credential name).

Television Production I 8688

Suggested Grade Level(s): 10 or 11 (36 weeks, minimum 140 hours)

Students learn to operate equipment such as TV cameras, video tape recorders, microphones, audio mixers, and audio/video editing systems. They practice skills related to production, direction, and scripting of programs and set design and construction. Students also study control room procedures and responsibilities.

Concentration Sequences (a combination of the course above and those below, equivalent to two 36-week courses) **Students wishing to complete a specialization may take additional courses appropriate to their career pathways.**	**Career Cluster(s) for federal reporting (choose one)**	**Available Credentials upon Completion of the Above Course**
• Television Production II 8689	Arts, Audio/Video Technology and Communications	See Section 10 for a listing of applicable credentials (by course name or credential name).

Television Production II 8689

Suggested Grade Level(s): 11 or 12 (36 weeks, 280 hours)

Prerequisite(s): Television Production I 8688

Students continue to learn to operate equipment such as TV cameras, video tape recorders, microphones, audio mixers, and audio/video editing systems. They practice skills related to production, direction, and scripting of programs and set design and construction. Students also study control room procedures and responsibilities. The cooperative education method is available for this course. Students combine classroom instruction and supervised on-the-job training in an approved position with continuing supervision throughout the school year.

Concentration Sequences (a combination of the course above and those below, equivalent to two 36-week courses) **Students wishing to complete a specialization may take additional courses appropriate to their career pathways.**	**Career Cluster(s) for federal reporting (choose one)**	**Available Credentials upon Completion of the Above Course**
• Television Production I 8688	Arts, Audio/Video Technology and Communications	See Section 10 for a listing of applicable credentials (by course name or credential name).

Television Production III 8690 (This course is in transition.)

Trade and Industrial Education Dual Enrollment with Postsecondary 8801

Information is available from the Trade and Industrial Education program service area, Virginia Department of Education.

Note: The career cluster will be determined by other courses taken in conjunction with this course to build a concentration sequence.

Utility/Heavy Construction Technology I 8616

Suggested Grade Level(s): 10 or 11 (36 weeks, minimum 140 hours)

This program provides both the knowledge and the hands-on skills needed to secure a job as a construction equipment operator. Students learn about site grading and development, excavation, concrete structures, pipe laying, road building, and other topics. Completion of this sequence may prepare students for the certification exam for medium/heavy truck technician or parts specialist.

Concentration Sequences (a combination of the course above and those below, equivalent to two 36-week courses) **Students wishing to complete a specialization may take additional courses appropriate to their career pathways.**	**Career Cluster(s) for federal reporting (choose one)**	**Available Credentials upon Completion of the Above Course**
• Utility/Heavy Construction Technology II 8617	Architecture and Construction	See Section 10 for a listing of applicable credentials (by course name or credential name).

Utility/Heavy Construction Technology II 8617

Suggested Grade Level(s): 11 or 12 (36 weeks, 280 hours)

Prerequisite(s): Utility/Heavy Construction Technology I 8616

This program provides both the knowledge and the hands-on skills needed to secure a job as a construction equipment operator. Students learn about site grading and development, excavation, concrete structures, pipe laying, road building, and other topics. They study soil, learn to read blueprints, and have the opportunity to gain experience in operating bulldozers, backhoes, front-end loaders, excavators, and motor graders. Completion of this sequence may prepare students for the certification exam for medium/heavy truck technician or parts specialist.The cooperative education method is available for this course. Students combine classroom instruction and supervised on-the-job training in an approved position with continuing supervision throughout the school year.

Concentration Sequences (a combination of the course above and those below, equivalent to two 36-week courses) **Students wishing to complete a specialization may take additional courses appropriate to their career pathways.**	**Career Cluster(s) for federal reporting (choose one)**	**Available Credentials upon Completion of the Above Course**
• Utility/Heavy Construction Technology I 8616	Architecture and Construction	See Section 10 for a listing of applicable credentials (by course name or credential name).

Utility/Heavy Construction Technology III 8618 (This course is in transition.)

Welding I 8672

Suggested Grade Level(s): 10 or 11(36 weeks, minimum 140 hours)

Students learn to use gases and electric arc processes to fabricate and weld metal parts according to diagrams, blueprints, and specifications. Students will also receive all safety-related practices and techniques including the OSHA 10 card.

Concentration Sequences (a combination of the course above and those below, equivalent to two 36-week courses) **Students wishing to complete a specialization may take additional courses appropriate to their career pathways.**	**Career Cluster(s) for federal reporting (choose one)**	**Available Credentials upon Completion of the Above Course**
• Welding II 8673	Manufacturing	See Section 10 for a listing of applicable credentials (by course name or credential name).

Welding II 8673

Suggested Grade Level(s): 11 or 12 (36 weeks, 280 hours)

Prerequisite(s): Welding I 8672

Students continue to apply the practices and techniques learned in Welding I using advanced welding techniques to fabricate and weld metal parts according to diagrams, blueprints, specifications, and industry certification. The cooperative education method is available for this course. Students combine classroom instruction and supervised on-the-job training in an approved position with continuing supervision throughout the school year.

Concentration Sequences (a combination of the course above and those below, equivalent to two 36-week courses) **Students wishing to complete a specialization may take additional courses appropriate to their career pathways.**	**Career Cluster(s) for federal reporting (choose one)**	**Available Credentials upon Completion of the Above Course**
• Welding I 8672	Manufacturing	See Section 10 for a listing of applicable credentials (by course name or credential name).

Welding III 8674 (This course is in transition.)